Classic Trains
MAGAZINE

Electric Railroad Classics

Passenger, freight, commuter, and interurban trains under wire and beside third rail

Electrics in the diesel age

Railroad electrification was the bright new dawn that never came

By William D. Middleton

FOR MOST OF THE FIRST HALF of the 20th century, the United States led the world in railroad electrification. American inventors and experimentation in the 19th century had developed much of the new technology of electric operation. Electric traction became feasible for street railways in the late 1880's, and within a decade had been applied to the much more demanding requirements of mainline railroading.

Electric locomotives capable of railroad duties began to appear as early as 1893. Even before then, in 1892, the Baltimore & Ohio had made the daring decision to bet the success of its new Howard Street Tunnel in Baltimore on electric operation. B&O contracted with the fledgling General Electric Company to supply the 500-volt D.C. electric power system and three locomotives to pull trains through the tunnel. Electric operation began in 1895, and the new motive power quickly proved itself.

The first decade of the new century was a time of remarkable progress for the new technology. In New York, the New York Central completed an extensive third-rail D.C. suburban electrification; the New Haven Railroad launched a pioneering A.C. project that would ultimately reach New Haven, Conn.; and the Pennsylvania began work on its great New York tunnel and terminal project that would depend upon electrification to bring trains into Manhattan through Hudson and East River tunnels.

Electrification proved to be the answer to the problems of steam operation in tunnels, and electrics went to work in Grand Trunk Western and Michigan Central bores under the St. Clair and Detroit rivers in Michigan; Great Northern's Cascade Tunnel in Washington; and Boston & Maine's Hoosac Tunnel in Massachusetts. Electric multiple-unit suburban trains began operating on the PRR's Long Island and West Jersey & Seashore subsidiaries, and on suburban lines in the San Francisco Bay Area.

More triumphs followed. In the West, the Butte, Anaconda & Pacific and much of the Milwaukee Road's Pacific Extension were wired up for high-voltage D.C. Pocahontas coal roads Norfolk & Western and Virginian both installed single-phase A.C. systems. At Chicago, the Illinois Central put its suburban service under catenary, and the Lackawanna and the Reading soon followed suit in northern New Jersey and at Philadelphia.

The greatest of all U.S. electrifications was completed by the Pennsylvania during the 1930's. When the last extension reached Harrisburg in 1938, Pennsy had almost 2200 track-miles of some of the busiest railroad in North America under catenary. By this time the U.S. stood as the world leader in railroad electrification. With 2400 route-miles and more than 6300 track-miles under electric power—far more than any other country —U.S. electrification represented more than 20 percent of the world total.

In almost every instance, electrification had delivered on its promise. Electric power substantially reduced running times and boosted line capacity. Electric locomotives operated at much lower fuel and maintenance costs than the steam power they replaced. Their availability was two to three times greater, and their effective service lives promised to be twice as long as those of steam locomotives. Electric traction's proponents pointed to these benefits and predicted a bright future for U.S. electrification. A 1936 report by the Federal Power Commission, for example, suggested that electrification of an additional 12,000 miles of track on 20 railroads was economically feasible. The outbreak of World War II only temporarily—it was thought—brought the expansion of U.S. electrification to a halt.

Postwar optimism

While the war delayed any additional electrification, it helped accelerate some technological developments that promised to make it more attractive than ever before.

Most important by far was the development of practical rectifiers for locomotives, an advance that resolved several long-standing problems. The industry had long debated the relative merits of single-phase A.C. vs. D.C. High-voltage, single-phase A.C. provided substantial efficiencies in power distribution, while low-voltage D.C. traction motors offered the best control and performance characteristics. The rectifier, which permitted the efficient conversion of A.C. to D.C. power, made it possible to combine the best of both systems. Previously, too, the large single-phase motors used for A.C. electrification had required the use of low-frequency power. With rectifiers, the catenary could be energized with 60-cycle current directly from the commercial power grid, eliminating the costly substations, conversion equipment, and separate transmission lines that had been required for A.C. electrification.

Another handicap to electrification had been the anticipated unbalanced power loads that would have resulted from powering large, single-phase railroad electrifications from the three-phase commercial power system. The growth of the electric power market after World War II, however, minimized this potential problem, and the threat of unbalanced railroad power demands ceased to be a major deterrent.

Even dieselization, which rose in the

After helping diesel-powered freight 261 over St. Paul Pass, a Milwaukee Road "Little Joe" electric moves into the clear at Avery, Idaho, in July 1972.

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TED BENSON

Virginian E33's 132 and 133 lead a coal train east out of Princeton, W.Va., in June 1958. These early rectifier units later worked for NH, PC, and Conrail.

late 1930's as the principal rival to electrification, brought developments that were seen as helpful to electric power as well. Since they were, after all, simply electric locomotives that carried their own power plant with them, diesel-electrics incorporated a number of components common to straight electrics. Thus, the mass-production techniques that the diesel builders applied to locomotives for the first time developed rugged, efficient, low-cost traction motors, trucks, drive systems, controls, and other components that were equally applicable to straight electrics.

Diesels could help in another way, too. In the pre-diesel era the full economic advantages of electrification could be realized only through the complete replacement of steam power and its costly servicing and maintenance facilities. To do this, electrification had to include yard tracks, branches, and other lightly used trackage at great additional cost. But by operating such secondary trackage with diesel power, which required less expensive servicing facilities, it became possible to confine electrification to the main running tracks.

With all these new advantages, together with emerging technologies, there was much talk of renewed electrification in the postwar years. Surveying the potential market for electrification shortly after the war, Earl Bill, manager of General Electric's railroad rolling-stock division, identified electrification projects totaling 1200 route-miles that were then under consideration. Most were additions to existing installations, including an extension of PRR catenary from Harrisburg to Pittsburgh, the New Haven's long-deferred New Haven-Boston electrification, extension of Great Northern's Cascade electrification into Seattle, and —the longest of all—a New York Central electrification from Harmon, N.Y., to Buffalo. An entirely new electrification under discussion would have put the Denver & Rio Grande Western under catenary through the Rockies.

In the Pacific Northwest, there was talk of low power rates from federal hydroelectric power plants and government investment to supply power at the trolley wire on as many as 8000 miles of line. Similarly, the Tennessee Valley Authority was looking at railroad electrification as a new market for its power-generation plants.

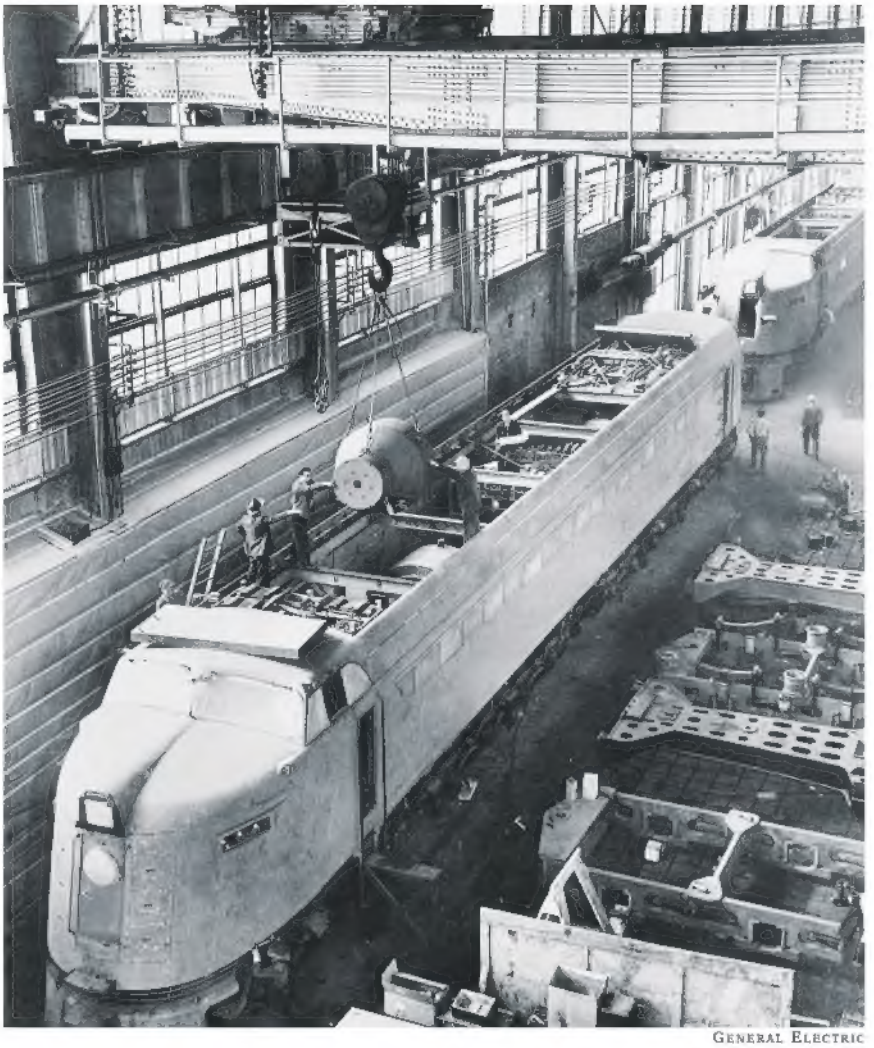
"Currently there is enough interest in electrification so that should the projects materialize into actualities the electric locomotive manufacturers would be unable to handle the business," commented Bill.

New technology brings new motive power

While there was no immediate action toward new electrifications, there were some interesting applications of new technologies on existing systems.

The first electric locomotives ordered after the war represented what was essentially an "old" technology. Needing additional power for their single-phase A.C. electrifications, both the Virginian

J. Parker Lamb



General Electric

At GE's Erie (Pa.) plant, a traction generator is set into one of Great Northern's W-1 electrics. Colossal in size, the W-1's were conservative in design.

and Great Northern placed orders with GE for what would be some of the largest electric locomotives ever built. Instead of trying the new and as yet unproven rectifier technology to convert high-voltage A.C. power from the trolley wire to low-voltage D.C. for the traction motors, both orders employed the older concept of motor-generators to accomplish the same thing. GN's two streamlined W-1's, delivered in 1947, were enormous 101-foot-long, 360-ton B-D+D-B units with a continuous rating of 5000 h.p. that ranked as the largest single-unit electrics ever built. Virginian's four EL-2B's, also streamlined, were made up of paired B-B+B-B units that were 150 feet, 8 inches long and weighed 517 tons. Each EL-2B set was rated at 6800 h.p.

Impressive as these new locomotives were, they were technological dinosaurs. Both of the principal suppliers of electric motive power, GE and Westinghouse, soon came forth with new experimental units for the PRR that were seen as prototypes for the anticipated new electrification market.

During 1951, GE delivered six Pennsy E2b-class units that, with their carbody design and B-B wheel arrangement, were based upon contemporary diesel-electric practice and ideas GE engineers had developed for a "standard" locomotive for new U.S. electrification. But instead of employing the new rectifier technology, with D.C. traction motors, GE used A.C. commutator motors similar to those employed on earlier PRR electrics. Operated as two-unit locomotives, the E2b's could produce a continuous output of 5000 h.p.

In 1949 the PRR had equipped one of its MP54 M.U. cars with an experimental ignitron-rectifier, with encouraging results, and the same technology was selected for a pair of experimental two-unit, 6000 h.p. locomotives delivered by Baldwin-Lima-Hamilton and Westinghouse during 1951 and '52. Otherwise identical, two class E3b units had a B-B-B wheel arrangement, while two E3c units had a C-C arrangement.

Both experimental designs worked well, but the Westinghouse ignitron-rectifier design was particularly successful. While the Pennsy delayed the replacement of its aging P5a locomotive fleet for almost another decade, other electrified roads soon adopted the new technology. The New Haven was the first, with an order for 100 Pullman-Standard M.U. cars in 1954 that were equipped with Westinghouse ignitron rectifiers.

Despite the Westinghouse success with its experimental ignitron-rectifier units, GE came up with all the locomotive orders. In 1955 GE completed 10 4000 h.p. E40 electrics for the New Haven. These EP-5's, as the NH called them, were the first production-model rectifier locomotives to operate in the U.S. The Virginian followed suit with an order for a dozen 3300 h.p. C-C ignitron-rectifier units from GE. Arranged in the same road-switcher configuration typical of diesel-electric practice, each of the E33's (VGN class EL-C) weighed 174

BERT PENNYPACKER

JIM SHAUGHNESSY

PRR Baldwin-Westinghouse E3b's 4995 and 4996 (top) leave South Philadelphia in April 1952. New Haven was first to order rectifier electrics, but later cut back its juice operations, as seen at Stamford, Conn., where dual-power FL9 diesels pass a train of rectifier M.U.'s ("Washboards") in May 1959.

tons. Beginning in 1960, GE delivered what would be its last big order for electric motive power, a fleet of 66 4400 h.p. E44 units that were essentially an advanced version of the earlier Virginian E33's. The last five units delivered had newer air-cooled silicone-diode rectifiers, which were both simpler than the ignitron rectifiers and permitted an increase in output to 5000 h.p. Subsequently, the entire E44 fleet was converted.

The E44's were prodigious performers that ably demonstrated the capabilities of modern electrification practice. The 66 units had been intended to replace all 92 of the Pennsy's older P5a's. In practice they proved capable of more than half again as much work per unit-month as a P5. Even before getting the upgraded rectifiers, the E44's were able to handle 20 percent more drag freight tonnage than either a P5 or a GG1. Availability, even during the break-in period, was nearly 92 percent. Maintenance costs were only one-third of those for the P5's, and only 25 percent of those for diesel-electric power in the same service.

The Pennsylvania acquired its first rectifier-equipped M.U. cars in 1958, and over the next decade large fleets of similar equipment were ordered for both PRR and Reading commuter services at Philadelphia, and for the Pennsy's New Jersey services.

What went wrong?

Despite the strong performance of this advanced electric motive power, U.S. electrification languished. Not a single one of the electrifications that had seemed so likely at war's end ever went ahead. Indeed, much of the earlier electrification began to disappear.

What went wrong? A simple answer: the diesel-electric.

But there was more to it than that, for the failure of electrification was tied as well to the availability of capital, the prospective availability and cost of electric power, and the willingness of railroad managers to commit to such a costly, long-term and, ultimately, uncertain investment.

The diesel-electric, of course, was the primary force that frustrated electrification. When the Pennsylvania undertook what proved to be the last major electrification in the 1930's, diesel power was still unproven. But by the time the war was over, there was little doubt about what the diesel could do. The war left the railroads with some hard choices to make. With plant and equipment worn out, they were faced with large and costly renewal and replacement requirements. At the same time, the capital available for these needs was limited.

Under these conditions, dieselization was an attractive investment. From a strictly operational point of view, electrification had a big edge over either steam or diesel power in both performance characteristics and operating costs. But the diesel afforded many of these same efficiencies at much lower capital cost. Some data developed by GE's Earl Bill from a 1946 study of New York Central motive-power modernization between Harmon and Buffalo is revealing.

The Central's study, which compared capital and operating costs for electric, diesel-electric, and modern steam power, projected annual operating and fixed-charge savings of more than $2.9 million for electric power over those for steam. Comparable savings for diesel operation were just under $1.8 million. While this would seem to give a clear advantage to electrification, the picture changed when a return on investment was considered. A Harmon-Buffalo conversion to modern steam power would have cost $80.5 million, while dieselization would have cost $104.5 million and electrification $135 million. At these estimated costs, NYC's return on the excess cost of electrification over modern steam power would have been 5.39 percent, while the return would have risen to 7.5 percent for the excess cost of dieselization over steam power. When the relative investments required for electrification and dieselization were compared, the return on the excess first cost of electrification was only 3.75 percent.

With numbers like this and investment capital in short supply, the Central began a conversion to diesel power. For other roads considering electrification, the results were more or less the same, and none of the expansive projects being talked about at war's end ever moved beyond the drawing board.

RICHARD STEINHEIMER

Five of GE's hugely successful E44's—three on one train, two on another—depart side-by-side from Pennsy's big Enola (Pa.) freight yard in 1965.

Not only had electrification ceased to grow, it began to decline as well. Here, too, the diesel was often the culprit.

One decided advantage of the diesel over steam power was its ability to run over long distances without changes of power. Electrifications that had been installed primarily for smoke abatement in long tunnels impeded the efficiencies of run-through operation, while diesel exhaust proved to be manageable with improved tunnel ventilation systems. The Boston & Maine ended electric operation through the long Hoosac Tunnel as early as 1946, and before the end of the 1950's, B&O's Howard Street Tunnel at Baltimore, NYC's Detroit River Tunnel, GN's Cascade Tunnel, and CN-GTW's St. Clair River Tunnel all had been dieselized. Urban smoke abatement being the only reason for NYC's Cleveland Union Terminal electrification, it was gone by 1953.

The merger movement that began to rearrange the railroad industry in the 1950's took more electrifications off the map. Following the merger of the Virginian into Norfolk & Western in 1959, the N&W revised the flow of coal traffic to take advantage of the best grades on the merged system. This left the former Virginian electrification with largely one-way eastbound traffic over its eastern end. This handicapped the utilization of both electric and diesel power, and N&W shut down the VGN electrification in 1962. (By contrast, N&W's own electrified district had reverted to steam operation in 1950 after a line relocation eased grades and curves.)

The Pennsylvania's extensive electrification survived into the 1968 Penn Central merger, but the subsequent PC bankruptcy and the formation of Conrail in 1976 brought major changes to the flow of freight that had once moved under Pennsy catenary. The New York-Washington segment of the Northeast Corridor had been conveyed to Amtrak, and Conrail shifted much of the freight to non-electrified former Reading and Lehigh Valley lines, while much of the traffic west of Philadelphia that had used the PRR's electrified low-grade routes was shifted to former Reading track. With these changes, electric operation was no longer economic, and Conrail lowered its pantographs in 1981.

A few electrifications disappeared for still other reasons. When the installation of a new ore concentrator at Butte, Mont., dramatically reduced ore traffic over the Butte, Anaconda & Pacific, the railroad shifted what traffic remained to diesels and shut off the power in 1967. After 50 years of operation, the electric locomotives and power system on the Milwaukee Road's Pacific Extension were largely worn out. Run-through diesels took over an increasing share of the traffic, and the catenary was de-energized on the last segment in 1974.

Another false dawn

But even as these older electrifications were fading away, there was once again renewed consideration of the

Suburban success stories

BETHLEHEM STEEL

Budd-built Silverliner 9007 pulls into Fox Chase station, outer end of a 5.2-mile extension of Reading catenary opened in 1966.

WHILE MOST mainline electrifications declined after World War II, suburban or commuter installations fared much better. The new Golden Gate and Bay bridges had helped end the San Francisco Bay Area's Northwestern Pacific and Southern Pacific suburban electrifications on the eve of the war, while automobile commuting into Philadelphia via the Ben Franklin Bridge helped shut down similar West Jersey & Seashore services in 1949. But elsewhere, the electrified 5:15 continued to flourish; electric operation provided performance characteristics for these demanding, high-density services that could not be equaled with diesel power.

Most suburban electrifications suffered from deteriorating maintenance and deferred equipment renewal during the long postwar decline of rail passenger services, but by the end of the 1950's a flow of public funding had begun that would ultimately re-equip, rehabilitate, and modernize rail commuter services. Two of them were even completely re-electrified. In 1984, New Jersey Transit completed a conversion of the former Lackawanna electrification from D.C. to a modern A.C. system, while the Montreal-area commuter authority completed a similar conversion of the former Canadian National installation in 1995.

As the suburbs grew, a few of the electric systems were even extended. Modest additions pushed Reading's Philadelphia-area catenary to Fox Chase and Warminster, while Illinois Central's Chicago suburban wires were extended south to University Park. In the 1980's, Philadelphia's SEPTA realized a decades-old dream by unifying the former Pennsy and Reading commuter services with a connecting Center City Commuter Tunnel; SEPTA also added a new line to Philadelphia International Airport.

NJ Transit wire reached Long Branch, N.J., in 1988. Under New York's MTA, the former NYC third-rail electrification saw a modest extension from North White Plains to Brewster in 1984, while Long Island third rail grew by almost 40 miles, with extensions to Hicksville and Huntington in 1970, and to Ronkonkoma in 1988. By 2000 an entirely new 25 kV electrification of the fast-growing 80-mile Caltrain (formerly Southern Pacific) route from San Francisco to San Jose and Gilroy was under serious study. The installation would represent North America's first new commuter rail electrification since the Reading completed its Philadelphia system during 1931-33.—*W.D.M.*

promise of electric operation for American railroads.

In 1965 a special task force of the Edison Electric Institute, a utility industry association, studied electrification of the New York Central main line between Harmon and Cleveland as a basis for investigating the feasibility of electrification of high-density rail operations. The report, published in 1970, concluded there were no serious technical obstacles to commercial-frequency electric operation, and recommended electrification of high-density corridors as both advantageous to the railroads and a desirable new market for utility companies. About 22,000 track-miles, the report estimated, supported a traffic density sufficient to warrant electrification.

This interest in electrification took on a new urgency with the advent of the energy crisis of the early 1970's and the rise in diesel fuel prices that came with it. Southern Pacific began studying electrification of its Sunset Route between Colton, Calif., and El Paso, Texas, in the late 1960's. By the early '70's, Canadian Pacific was considering an 850-mile installation across the Rocky Mountains. Burlington Northern studied electrification for several principal lines in 1973, with the route between Laurel, Mont., and Lincoln, Nebr., a leading candidate because of growing traffic in low-sulfur coal. Union Pacific looked at wires for its main line from North Platte, Nebr., to Salt Lake City and Pocatello, Idaho, in the early 1970's. The Santa Fe, which weighed electrification at the end of World War II and again in 1960, began another study in 1972, this time for its entire Chicago-Los Angeles main line.

Illinois Central Gulf contemplated wiring its Chicago-New Orleans main line and several of its branches. Together with the Tennessee Valley Authority, the Southern Railway began a study of electrification of its Cincinnati-Chattanooga main line, later extended to Atlanta. In 1971, even in bankruptcy, Penn Central was mulling an extension of its former PRR electrification on the former New York Central line up the west shore of the Hudson River to Selkirk Yard at Albany, N.Y. By the end of the decade, only a few years before it shut down its existing electrification, successor Conrail was studying a Harrisburg-Pittsburgh project over the Alleghenies that the Pennsy had considered many times before. Still other roads that at least considered electrification included Missouri Pacific; Duluth, Missabe & Iron Range; Bessemer & Lake Erie; Canadian National; Denver

& Rio Grande Western; Quebec North Shore & Labrador; and C&O/B&O.

All of these studies were based upon a new concept of high-voltage, commercial frequency A.C. electrification. The principal motive-power suppliers saw it as a major new market. "We're committed to electrification," said a GE spokesman, "the apparent economic benefits make it inevitable." Even diesel builder Electro-Motive hedged its bet and acquired licenses for electrification technology from Swedish manufacturer ASEA. In 1975 and '76 EMD put experimental 6000 and 10,000 h.p. prototype locomotives for a new line of electric power into service on Penn Central.

Several new mine-to-generating plant coal lines completed in the late 1960's and '70's were seen as prototypes for this new vision of railroad electrification. The Muskingum Electric Railroad in Ohio and two Texas Utilities Co. lignite lines in east Texas were equipped with 25,000-volt, 60-cycle, single-phase A.C. systems, while the Black Mesa & Lake Powell in Arizona was wired up with a 50,000-volt system that was seen as the prototype for Western electrification. GE supplied thyristor-controlled, silicon-diode rectifier locomotives for all three installations.

But once again, electrification proponents were in for disappointment. For despite all the interest and all the studies, very little happened. Two more new, isolated coal lines were electrified in the West, and the British Columbia Railway electrified a new branch built for export coal traffic. There was only one new mainline electrification, for a new National Railways of Mexico route between Mexico City and Querétaro, and it never did go into full operation.

What happened this time?

After a decade of sharply rising diesel fuel prices, the petroleum-based energy crisis of the 1970's had largely abated by the early '80's, and diesel prices began to fall. At the same time, the diesel builders continued to develop new generations of locomotives of steadily improving performance and increasing fuel efficiency. Over the 40-year period from 1955 to 1995, for example, diesel fuel efficiency more than doubled. The diesel-electric remained a formidable alternative to railroad electrification.

The enormous capital cost and the risks associated with electrification, too, were still strong deterrents. Even if the projected return on investment looked good, there was still plenty to worry about. Could the electrification be completed on time and at the projected cost? Would electric power be available at stable rates? Would the utilities have the generating capacity to take on the railroad load? If new power plants were needed could the utilities bring them on line in time? Change any of these parameters and electrification might not produce the anticipated benefits.

With diesel-electrics that continued to gain in performance and efficiency, and faced with all the risks and uncertainties that accompanied expensive electrification projects, the railroads yet again turned away from electrification.

Will the bright new dawn of widespread electrification *ever* come?

Consider the steadily rising curve of annual freight ton-miles, and think about the way more and more traffic is being concentrated on key routes as the industry consolidates through merger, and it's easy to think that electrification will one day be needed just to deal with capacity needs. But if and when that day comes, will the railroads have the resources to carry it out? Or will it take government support, as it did to finally get Amtrak's old New Haven catenary into Boston recently, or as it has where electrification has flourished almost everywhere else in the world?

Only one thing is certain, and that is that we'll surely be talking about the uncertain prospects for railroad electrification for many years to come. ■

WILLIAM D. MIDDLETON has written extensively about railroad electrification. This article was adapted from the second edition of his book When the Steam Railroads Electrified, to be published later this year by Indiana University Press.

For more on electrification in the diesel age, visit our website: ***classictrainsmag.com***

Muskingum Electric GE E50 locomotive 200 rolls a train southward shortly after the opening of the 15-mile, mine-to-power plant railroad in 1969.

OHIO POWER CO.; COLLECTION OF JOHN B. CORNS

Long Island's lovable double-deckers

Not everyone loved them—and they weren't really double-deck—but the unique clan of commuter cars will never be forgotten

By Mike Boland

THEIR SIZE AND LENGTH were overwhelming. The big balloon roof with headlights and portholes at each end was always a pleasant sight. The two rows of paired windows staggered along the car side always seemed to disappear in the distance. With illuminated numberboards in the headlight housings—no other Long Island Rail Road electric multiple-unit car had this feature—you always knew which car you were looking at. And I appreciated the little touches, like the equipment trust plate in the upper corner of each car and the upper-level window guard bars to prevent passengers from placing their arms outside the car. That's how I remember Long Island's double-deckers.

The funny thing was that they weren't really double-deckers at all, though everyone called them that. Their staggered, two-tier seating configuration was unique in the U.S., having been created and patented by Albert E. Hutt of New York in 1928. Both the upper and lower levels of seats were reached from a single center aisle, which was two steps (about 14 inches) above the lower level and the same distance below the upper level. Ramps at each end of the aisle descended to standard vestibules. Each tier had pairs of fixed seats facing each other, and each group of four seats had a double window. Seating from 120 to 132 passengers, the double-deckers were an effort to increase capacity on the Long Island's busy third-rail electric lines into

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FRANK ZAHN

Car 1306—its tinted, sealed windows identifying it as a late 1960's rebuild—leads a Babylon train out of Jamaica in March 1971. Circular "Dashing Dan" logos are at each end above the stripe.

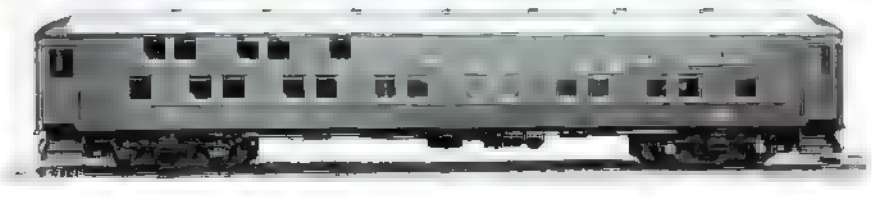
Pennsylvania Station, New York.

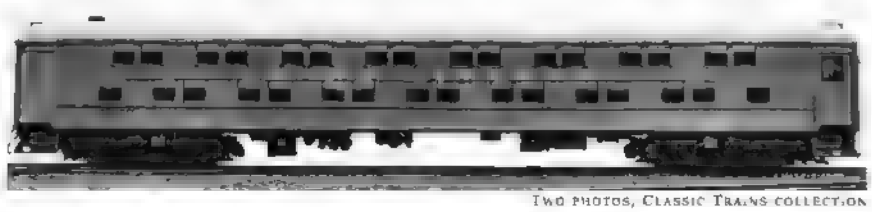
The Pennsylvania Railroad—Long Island's parent from 1900 to 1966—built three prototype double-deckers at its Altoona (Pa.) shops in the 1930's. In addition to their odd seating arrangement, they were built of aluminum to save weight. By the time LIRR decided to acquire a fleet of double-deckers, though, World War II had put such projects on hold. When aluminum and other materials became available for civilian use again, PRR built 60 double-deckers during 1947-49, just before I was born. It's now three decades after they were removed from service, but I still miss all 63 of them.

Hooked for life

I probably saw my first double-decker in Far Rockaway, Queens, from the apartment house in which I lived with my family during the early 1950's. It overlooked the elevated LIRR station, and that's how I got hooked on trains and the double-deckers. What a sight it was to see a solid consist of them rolling along the Rockaway Peninsula, 25 feet above the ground on a 5-mile-long concrete viaduct.

I was just a small boy then, but I wondered if the passengers enjoyed the view, especially during the summer. The double-deckers' air-conditioning



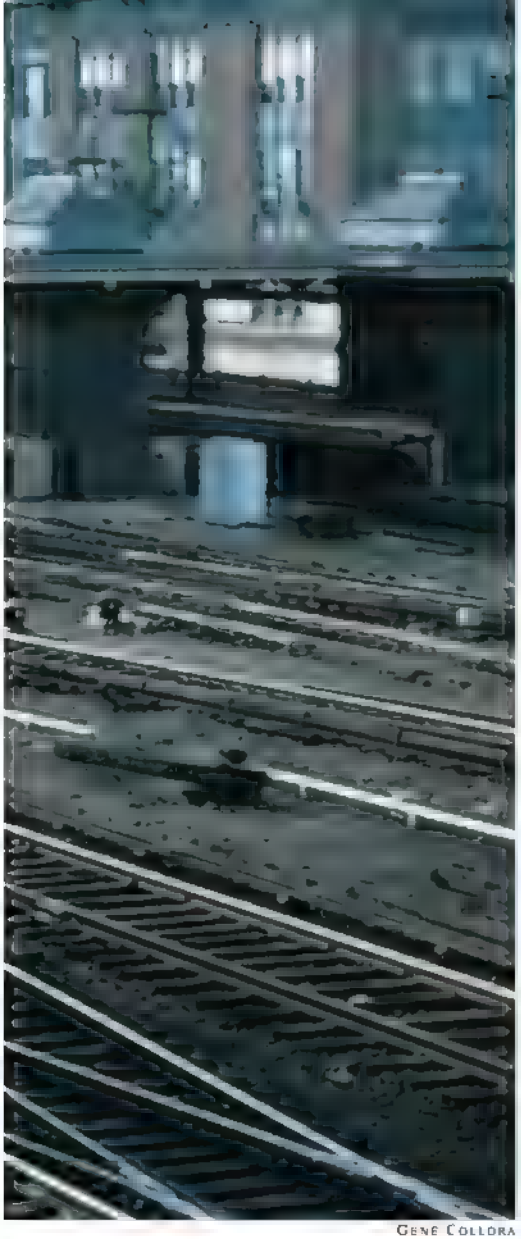


TWO PHOTOS, CLASSIC TRAINS COLLECTION

Prototype 200 (left) of 1932 differed from all its sisters in being just 72 feet long and lacking both motors and controls; this first double-decker is also the last, preserved at the Railroad Museum of Long Island, Riverhead. No. 205 (lower left), an early postwar car, shows off the double-deckers' standard 80-foot, 8¾-inch length.

left something to be desired, so I wonder if anyone ever opened a window to get a whiff of the nearby ocean. Had I been able to, I would have ridden the vestibule of the last car, for in those days the end door of the last car of just about every LIRR M.U. train would be open in hot weather to cool the train. You could stand there on your own private observation platform and feel the warmth of the sun while enjoying the scents of creosote, traction motors, brakeshoes, and salt air. At the Beach 98th Street station, the aroma became mixed with cotton candy, saltwater taffy, and popcorn from Playland, the nearby amusement park with its calliope and wooden roller coaster providing sounds as pleasurable as the ocean waves crashing three blocks away.

My first ride on a double-decker came on a trip to the 1964-65 New York World's Fair. When the New York Mets moved to Shea Stadium in Flushing from the Polo Grounds in 1964, it was even better for me, since the World's Fair station also served Shea. After Mets games, I always led the charge through the train to find the nearest dou-



GENE COLLORA

Sporting orange ends for better visibility, car 1328 heads east out of Jamaica station in October 1958. The two-tone gray livery designed by Lester Tichy was author Boland's favorite.

HENRY RAUDENBUSH

CLASSIC TRAINS COLLECTION

An interior view of a rebuilt car (top) shows the double-deckers' unique up-down seating arrangement, while a blueprint for the two 1937 cars notes a capacity of 134, not the actual 132.

ble-decker and then either step up or down to find seats. When you found seats for four, it was like sitting in a luncheonette booth with no table. It made conversation with friends easier, although when you sat with strangers, they avoided eye-to-eye contact. It was good practice for riding the subways.

For this Mets fan, half my fun was riding the double-deckers to Shea. Late one weekend afternoon after a game, I landed in the first car, so I walked to the front. The vestibule door behind the engineer was usually closed, and most times a green curtain was pulled down over the window to prevent railfan eyes like mine from watching. Other times, the door would be open and the canvas hung from the top of the frame. As I got to the door this time, I was in for a surprise: closed door but no curtain!

The next 15 minutes were spent in fascination as I watched the engineer handle our train. I can still hear the low, steady drone of the double-decker gearing as the Westinghouse motors slowly accelerated. The whining got higher and higher as the train gained speed. I was fascinated by the green "MAS" indication of the cab signal—it looked like a miniature traffic light—meaning Maximum Authorized Speed. I stayed there until the speed-control whistle sounded and the yellow "30" became illuminated as we began to approach Jamaica station, where we, like so many other LIRR riders, changed trains.

200, 201, 1347, et al

Over the years, I became pretty knowledgeable about double-deckers and began to look for the three prewar experimental cars with their two rows of roof vents. There was No. 200, a nonpowered trailer that also lacked operating controls. Built in 1932, this was the first double-decker. Unfortunately, I never got the chance to ride it. Then there were Nos. 201 and 1347, built as a "bride-and-groom" set in 1937; one car was a control-trailer, the other a control-motor. The pair was separated before my time, and I saw trailer 201 only once, but motor 1347 always seemed to show up and I rode it often.

Although riders at first liked them because they were new, the double-deckers proved to be unpopular with passengers and crews, and subsequent orders

were for longer, single-level cars with 3-2 seating. Yet to my surprise, the Long Island began to rebuild them in 1967. The rebuilds wore orange stripes along the letterboard with large, orange speed lettering at the bottom of the car They had new tinted, sealed windows, and most of them lacked the road's circular "Dashing Dan" herald, making them easy to spot. Among the rebuilds' interior features were new, more-comfortable seats and improved air-conditioning Alas, the rebuilding program ended after only 10 cars were done

Near the end, the double-deckers operated in solid consists of 10 cars, just as they did in their early days. Corrosion of their steel underframe and aluminum carbody via electrolysis would soon force their retirement. I remember being at Valley Stream station late one afternoon when a solid consist went by with motors, ballast, and rails all creating an unforgettable sound on the elevated structure. Control motors, motorized trailers, rebuilt cars, cars with stripes, cars without stripes, a prewar car, cars with Dashing Dan heralds, cars without Dashing Dan heralds, the lone car painted in MTA white and blue — the double-deckers' entire history passed before me in a few short seconds. And just like that, they were gone

In January '71, just over a year before their retirement, a solid train of double-deckers looks like a long, thin apartment building at Jamaica.

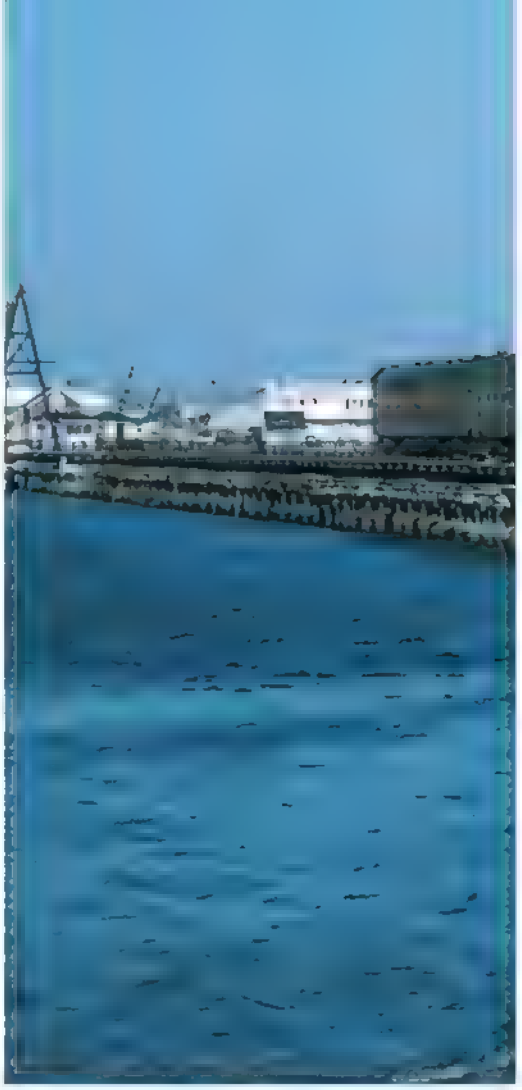
Bound for Long Beach, four double-deckers and a 1950's single-level car cross the old wooden trestle over Reynolds Channel in February 1968.

It was a moment in time, forever etched in my mind. And the best part was the expression the engineer gave me as he passed. He just glanced at me to see that I was watching his train. I was. We made eye contact for a split second and then he looked back to the track ahead of him He knew I liked what I saw. He didn't know I was the double-deckers' biggest fan

Say it ain't so!

I didn t know about the last run of the double-deckers until it was too late Rebuild No. 1301 ended it all on the afternoon of February 29, 1972, with a trip from Hempstead to Penn Station. The 1301 was on the west end of the train, and one local television station showed film of the train on its 10 p.m. news The LIRR said the cars were phased out, but the newspapers were more direct. "The Route of the Dashing Commuter turned into the rout of the double-decker," began one story

It was a tough article to read, with unkind words about my favorite cars. I had heard the stories that the double-deckers were a bad design and unpopular, but you couldn't convince me Then again, I never had to collect tickets from the passengers sitting in the lower tier, below the aisle of the car



J. M. GILLIN

Minutes away from their Penn Station destination, double- and single-deck cars on a Port Washington train pass PRR's Sunnyside Yard in 1955.

Wet aisles could be a problem for those seated on the lower level. Their facing seats earned them the nickname "knee-knockers." And I was no coach-cleaner, either, so maybe those cubicles were tough to clean. But I never heard an engineer complain about how they operated.

As a railfan and a rail commuter, I've ridden a lot of cars over the years on the Long Island Rail Road, but there's has been nothing like the double-deckers. A few years ago I remember hearing talk that there might be an M.U. version of the new, bilevel car now used in LIRR diesel service, but I wasn't worried. I knew it wouldn't happen. And it didn't. I knew there would never be anything like the double-deckers. And there hasn't.

JAMES G. LAVAKE

More on our website

A roster of the LIRR's double-deckers is available at our website, www.classictrainsmag.com

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Donald Dohner: The man who designed 'RIVETS'

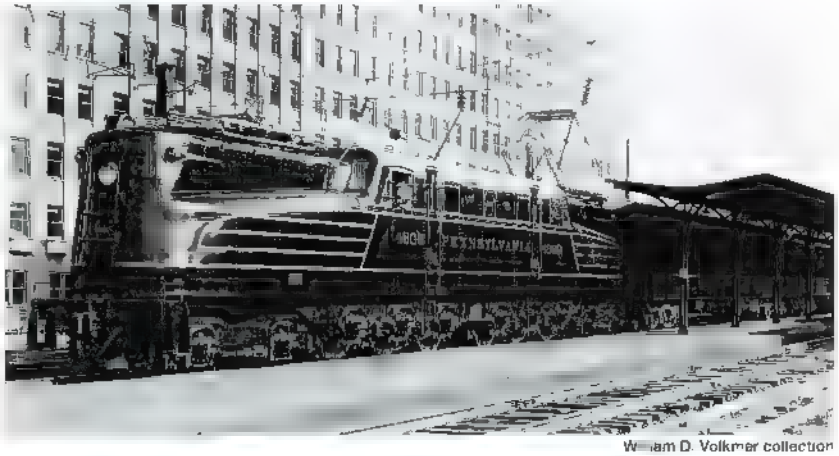
Long overshadowed by the flamboyant Raymond Loewy, the true designer of the GG1 was a major figure in his day

By Hampton C. Wayt

Few would deny that the GG1 is one of the most beloved locomotives in railroad history, and whenever any object reaches such an iconic status, its admirers are anxious to associate a name with its creation. For nearly 75 years, only one name—that of famed industrial designer Raymond Loewy—has been linked with the design of the GG1. But new information has surfaced which indicates that another well-respected industrial designer of the era—Donald Roscoe Dohner—was, as primary designer on the project, responsible for the design of the GG1 prototype locomotive, lovingly nicknamed "Rivets" for its riveted carbody shell.

Born in 1892, Donald Dohner was highly regarded as both an industrial designer and a design educator. In 1934 he started the first degree-granting, industrial-design program in the United States, at Carnegie Institute of Technology (now Carnegie-Mellon University) in Pittsburgh. One year later he moved to Pratt Institute in Brooklyn, N.Y., where he developed the industrial design curriculum that has made Pratt one of the leading design programs in the world to this day.

Dohner's career as an industrial designer began in East Pittsburgh with Westinghouse Electric & Manufacturing Co. (WEMCo), for which in 1930 he was named head of the new "Art in Engineering" department. In this capacity, Dohner was placed in charge of the design of the products manufactured in all 25 WEMCo plants across the country. During his four-year tenure at Westinghouse, Dohner would be credited with the design of more than 128 products,



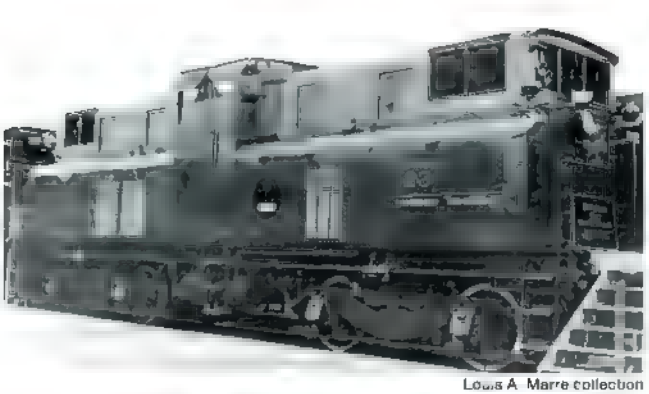
William D. Volkmer collection

Donald R. Dohner poses with three plaster models depicting his designs for what would become the GG1. Though slightly different from one another, their influence is apparent in the first GG1—"Rivets"—pictured at Broad Street Station, Philadelphia, in late 1934.

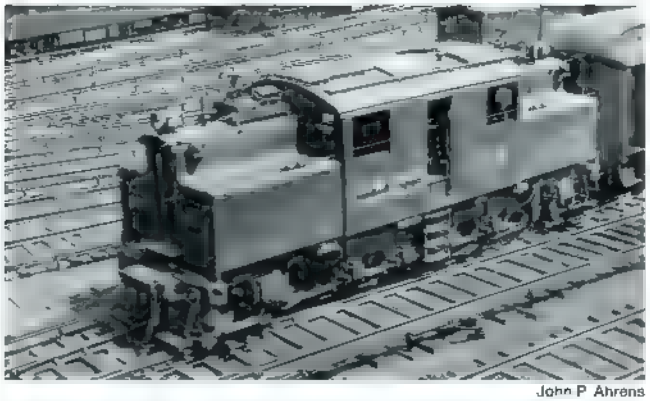
Jonathan L. Bartlett collection

CLASSIC TRAINS collection

PRR's dissatisfaction with its P5a 2-C-2's (like 4701 at Manhattan Transfer, N.J., in the early 1930's) prompted it to try a 2-C+C-2—the GG1. After a P5a engineer died in a grade-crossing accident, a safer cab arrangement was sought, resulting in Dohner's center-cab GG1 design.



Louis A. Marre collection



John P. Ahrens

Dohner's 1929 "visibility" cab design for Westinghouse diesel switchers (above left) presaged his GG1 configuration of five years later. The same concept of a central cab between two stepped hoods can be seen in New York Central's S-class third-rail electrics, first built in 1906.

ranging from ashtrays to locomotives

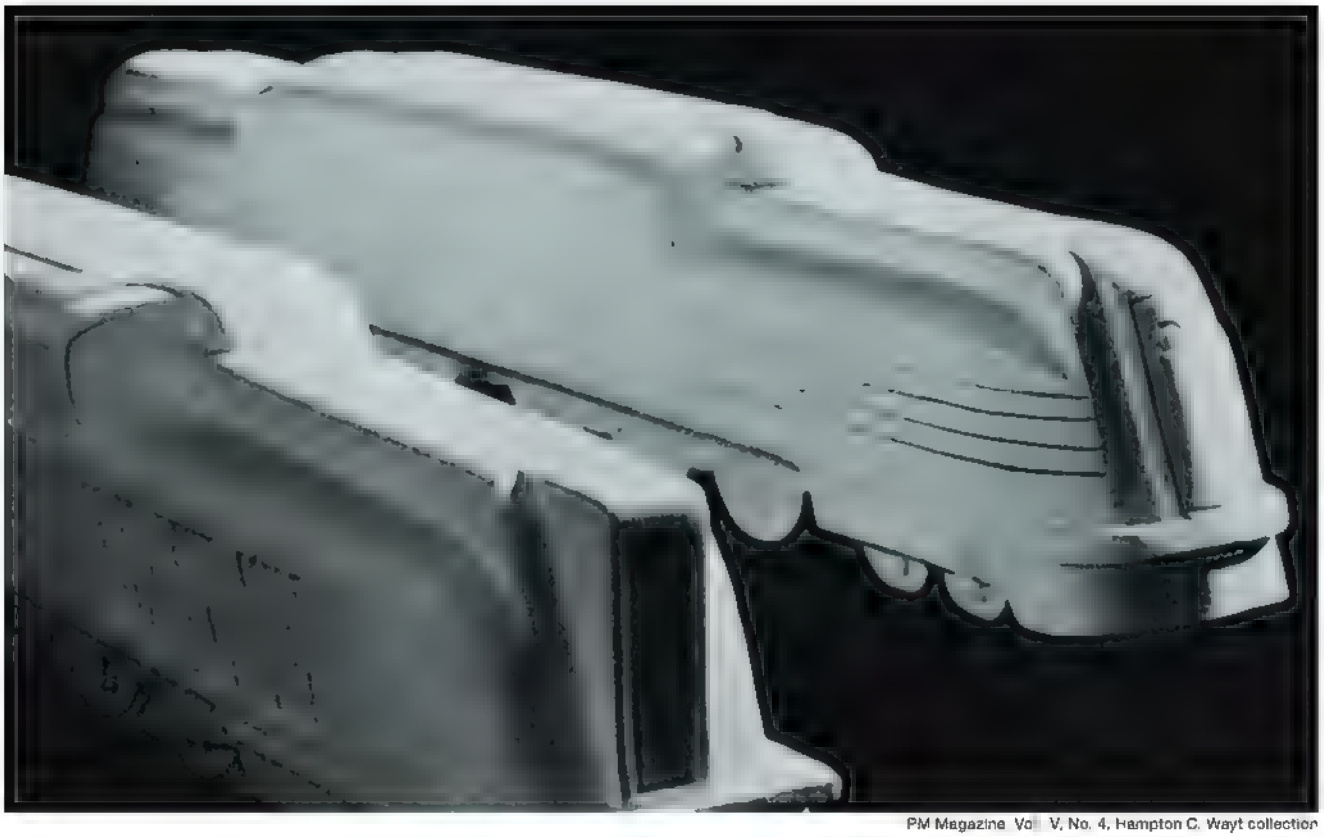
In 1998, the Industrial Designers Society of America, which is the professional organization of industrial designers, posthumously awarded Dohner with its highest honor, the Personal Recognition Award, for his outstanding contribution as a pioneer industrial designer and industrial design educator.

Design antecedents

The name Westinghouse has long been associated with the railroad industry, and as such, Dohner found himself in a prime position to work on several locomotives and trains. His earliest known involvement came in 1929, when he designed a diesel-electric switcher for Westinghouse. Available in single-engine, end-cab or dual-engine, center-cab configurations, the switchers possessed what Westinghouse termed a "visibility" cab, a feature that embodied a stepped hood to permit the use of a window facing the tracks for a view past the hood. In its center-cab version, Dohner's switcher was not conceptually dissimilar to two earlier electric-locomotive designs: New York Central's class S-1 motor of 1906 and Milwaukee Road's EP-2 "Bipolar" of 1919. Switchers are stubby by nature, so for his final touch, Dohner applied a special orange-and-blue paint job to give the units the appearance of being lower than in actuality. The switchers were deemed a success, reportedly selling based solely on the paint scheme.

More exciting than the switchers was Dohner's design of the New Haven's streamlined diesel-electric train, the *Comet* of 1935, which was co-engineered by Westinghouse and the Goodyear Zeppelin Co. Dohner's greatest achievement in railroad design, however, would be his work on electric locomotives for the Pennsylvania Railroad—in particular, the GG1

Rather than being designed in Pennsy's own shops, the GG1 was engineered at the Baldwin Locomotive Works under the direction of consultant engineer George Gibbs. Representatives from General Electric, Westinghouse, PRR, Baldwin, and Gibbs' own company, Gibbs & Hill, met regularly with Gibbs at the Baldwin plant near Philadelphia to make the project a reality. The railroad commissioned the new design for a high-speed passenger electric locomo-



PM Magazine Vo V, No. 4, Hampton C. Wayt collection

Even without pantographs, the basic elements of the GG1 design are apparent in these two Dohner plaster models, both of which are more sophisticated and cohesive than Rivets as it would actually be built. At the time, the first U.S. streamlined trains were just hitting the rails.

tive with an articulated 2-C+C-2 wheel arrangement because its existing fleet of P5a-class 2-C-2 box-cabs was proving unsatisfactory.

Gibbs received permission to start the GG1 project on January 3, 1934, which, by coincidence, was the very day that a P5a collided with a fruit truck at a grade crossing in Deans, N J., killing the engineer. The operating cabs on the P5a's, which were located at each end of the carbody, offered little protection for the crew. Safety of the locomotive crew would be a top priority for the future GG1 and for that very reason, by March 1934, a "steeple cab" configuration was chosen for the GG1—perhaps inspired by Dohner's visibility cab switchers of a few years earlier.

Dohner's own writings indicate that he created six plaster design proposal models for the project, and photographs of three of these recently have been discovered. (None of the six models is known to exist, and photos of the other three have yet to surface) Created at the very earliest stages of the project when the greatest leeway for the design was possible, the models exhibit a wide variety of treatments

Just as Dohner's first designs for the GG1 were taking shape, the Pennsylvania decided to construct a second experimental electric of a different configuration as a possible alternative to the Gibbs design. This 2-D-2 motor would be designated class R1. Whichever of these two locomotives proved superior in tests would be approved for production (the victor, of course, was the GG1). Pennsy also decided to order 28 additional P5a's, but the accident at Deans left the details of their carbody designs uncertain. The railroad made numerous studies in an effort to strengthen the existing P5a box-cab, but despite marked improvements, the efforts were eventually deemed unsatisfactory. It was then decided to redesign the P5a to match the center-cab design of the GG1. This version would become known as a "P5a modified." The R1 would likewise receive the GG1's shape. Subsequently, the designs of all three locomotives would be handled at Baldwin and their details discussed simultaneously

Comparing the models

Of the three known Dohner models, one closely resembles what would become the GG1. The minutes of a meeting held at Baldwin on April 17, 1934, describe two distinctive features found on this model—the cab skirting and the headlight mounted in the front door The headlight in the door would make it into production; the skirting would not. Curiously, a half-inch-scale wood model strikingly similar in design to this Dohner plaster model, and possessing these same two features, also has recently surfaced [see sidebar, page 35]. The construction methods used in the making of the wood model indicates that it was made in PRR's own shops.

Either model could have been at that April meeting, but one clue indicates that the Dohner plaster model predates the wood model, if only slightly. Both feature horizontal stripes on each end, the Dohner model having four thin lines (two long, two short) and the wood model five thick lines. One end of the Dohner model, however, was later altered to have the same stripes as the wood model over top of its original four. Examination of the wood model also reveals that these stripes are carved heavily into the carbody, indicating that they were meant to represent air-intake louvers as well as a striped paint scheme.

One of the reasons that Raymond Loewy's involvement in the GG1 project has been revered for so many decades is the great improvement of the production GG1's design over that of Rivets. Yet, close scrutiny of the Dohner models shows that all of them are more sophisticated in shape and more cohesive in

H. L. Broadbelt collection

No longer just a plaster or wood model, the first GG1 stands in full-sized steel outside Baldwin's Eddystone, Pa., shops, awaiting shipment to Erie, Pa., for completion by GE.

H. L. Broadbelt collection

Dohner's carbody configuration—designed initially for the GG1—was adapted for use on the one-of-a-kind R1 2-D-2, as well as the 28 P5a modifieds, including No. 4754, at Baldwin.

design than Rivets is—despite the fact that Rivets was based on these models. In fact, the smooth shape of these models is not far off of the production GG1's. How can this be?

There are several possibilities. For starters, the Dohner models were created early in the project, probably before the engineering of the locomotive had been fully determined. More importantly, PRR paperwork indicates that the development of the GG1's design continued for nearly two months after the engineering drawings for Rivets were completed (five months *before* Loewy's involvement). The only thing we conclude from this is that the shell design of Rivets was not what was intended for the production GG1's. With the knowledge that the experimental locomotive was rushed for testing, it is easy to accept that the shell design was also rushed. After all, the railroad didn't even know if the GG1 or the R1 would be chosen for production.

The PRR hired Loewy in November 1934 to further the development of the GG1 design for mass production. However, the sophisticated shapes and continuity of design evident in the Dohner models create some doubt as to how much Loewy actually contributed to the final design. One of Loewy's greatest accepted contributions is that of welding rather than riveting the body. Yet the complicated shapes of Dohner's designs would have been difficult to execute with the riveting process, making one wonder if the railroad might have already had welding in mind before Loewy was on the scene. A striped paint scheme also existed before Loewy, as can be seen on the Dohner and wood models and on Rivets itself. Interestingly, a memo from GE indicates that the early striped scheme found on Rivets was not actually designed by Dohner, but by a GE employee.

The legendary Loewy

Ironically, the GG1 project would be a seminal turning point in the careers of both Dohner and Loewy. At the time of his work on the GG1, Dohner was actually a better-known industrial designer than Loewy. And it was at this moment that Dohner chose to leave the design field to become an innovator in industrial-design education. He eventually returned to designing in 1943, but his sudden, tragic death later that year precluded him from regaining the level of recognition that he held during his Westinghouse years. The GG1 was perhaps the last and greatest design of Donald Dohner's professional career. At the same time, however, Loewy's involvement in the GG1 and his continued work for the PRR would thrust him into the limelight that Dohner had lost

Why haven't we heard of Dohner and his work on the GG1 before? There are many possible reasons. One is that Dohner's and Loewy's relationships with the Pennsylvania Railroad and the GG1 project were quite different. Dohner was a Westinghouse employee working with Baldwin on the project, and had limited contact with the PRR itself. Loewy, however, worked directly with Pennsy's top brass and later became the road's personal design consultant. Naturally, there would be no need for the

More on our Web site
See video clips of "Rivets" and other GG1's in action at www.ClassicTrainsMag.com

Dohner's design, rendered in wood

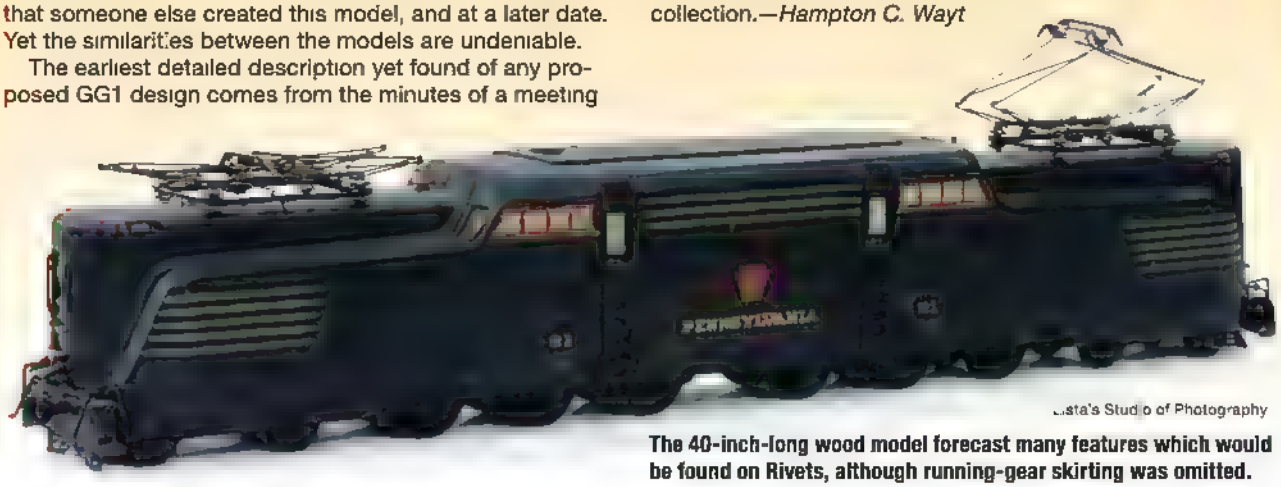
This early, half-inch-scale GG1 design proposal model, believed to have been constructed in the PRR's shops in April 1934, has surfaced recently after being in the collection of Randall Ross of Greensburg, Pa., for the last 40 years. Ross was already an avid rail enthusiast at age 8 when he received it. The story goes that the Ross family attended church with a man who was somehow involved with the Penn Central merger, and the man's daughter and Randall, who were the same age, were friends. One day the man was asked to clean out the PRR office in Philadelphia where the model was stored. Everything was to be thrown away, but the man didn't have the heart to dispose of the model. Instead, he took it to church and gave it to his daughter's train-crazy friend, Randall.

The model is very similar in design to one of the three known Donald Dohner plaster models. While it could be suggested that this is one of his three "missing" models (those for which no photos are known), several points suggest otherwise. The most obvious is that Dohner's models are plaster, while this one is wood and metal and similar to other models known to be built in PRR shops. Another is that Dohner modified the vents on his model to resemble ones like those found on this model, further suggesting that someone else created this model, and at a later date. Yet the similarities between the models are undeniable.

The earliest detailed description yet found of any proposed GG1 design comes from the minutes of a meeting held at Baldwin on March 29, 1934, found at the PRR archives of the Hagley Museum and Library in Wilmington, Del.: "The doors at the ends of the hoods present difficulties on account of the proposed slope of the ends, of the heavy wind pressures, and of the necessity for easy and safe passage from one locomotive to another when double-heading at high speeds. Several schemes are being studied." The nose of the wood model is completely vertical, in contrast with the plaster model it resembles, and would certainly be a solution to the railroad's concerns. The belief that the wood model was constructed by PRR would suggest that this model was its own interpretation of Dohner's design.

The Hagley's collection also reveals that the cab skirting found on both models was of great interest, as described at a meeting on April 17, 1934: "Access to flexible leads and also to driver springs makes use of skirt under sides of cab difficult. Appearance requires it, however, even if it has to be made removable." As we know, the skirting never found its way onto any GG1, and no records were uncovered to indicate why the skirting was not used. However, it is fairly easy to guess that the mechanical considerations outweighed the esthetics.

Randall Ross is still an avid railfan, and even has a 7½-inch-gauge miniature railway in his backyard. When he wanted funds for another locomotive for his pike, last year he offered the GG1 model for sale on the Web site discoverlivesteam.com. The model sold and now is in my collection.—*Hampton C. Wayt*



...sta's Studio of Photography

The 40-inch-long wood model forecast many features which would be found on Rivets, although running-gear skirting was omitted.

PRR to promote the name of Donald Dohner, the employee of another company, especially while paying handsome sums of money to its own consultant.

In reality, however, it was not the Pennsylvania Railroad that promoted the name of Raymond Loewy, but Loewy himself. Loewy, whose propensity for self-promotion is well recognized, had a p.r. staff dedicated to that purpose. In fact, only a few weeks after his GG1 design work was approved, and four months before the first production GG1 emerged from Altoona Works in April 1935, Loewy gave lectures at both the Pratt Institute and the Stevens Institute promoting his contribution to the GG1. In contrast, Donald Dohner was a modest man, who despite numerous published writings throughout the 1930's chose to espouse design philosophy and technique rather than his own personal achievements. This modesty, combined with his early death, has left Dohner all but forgotten.

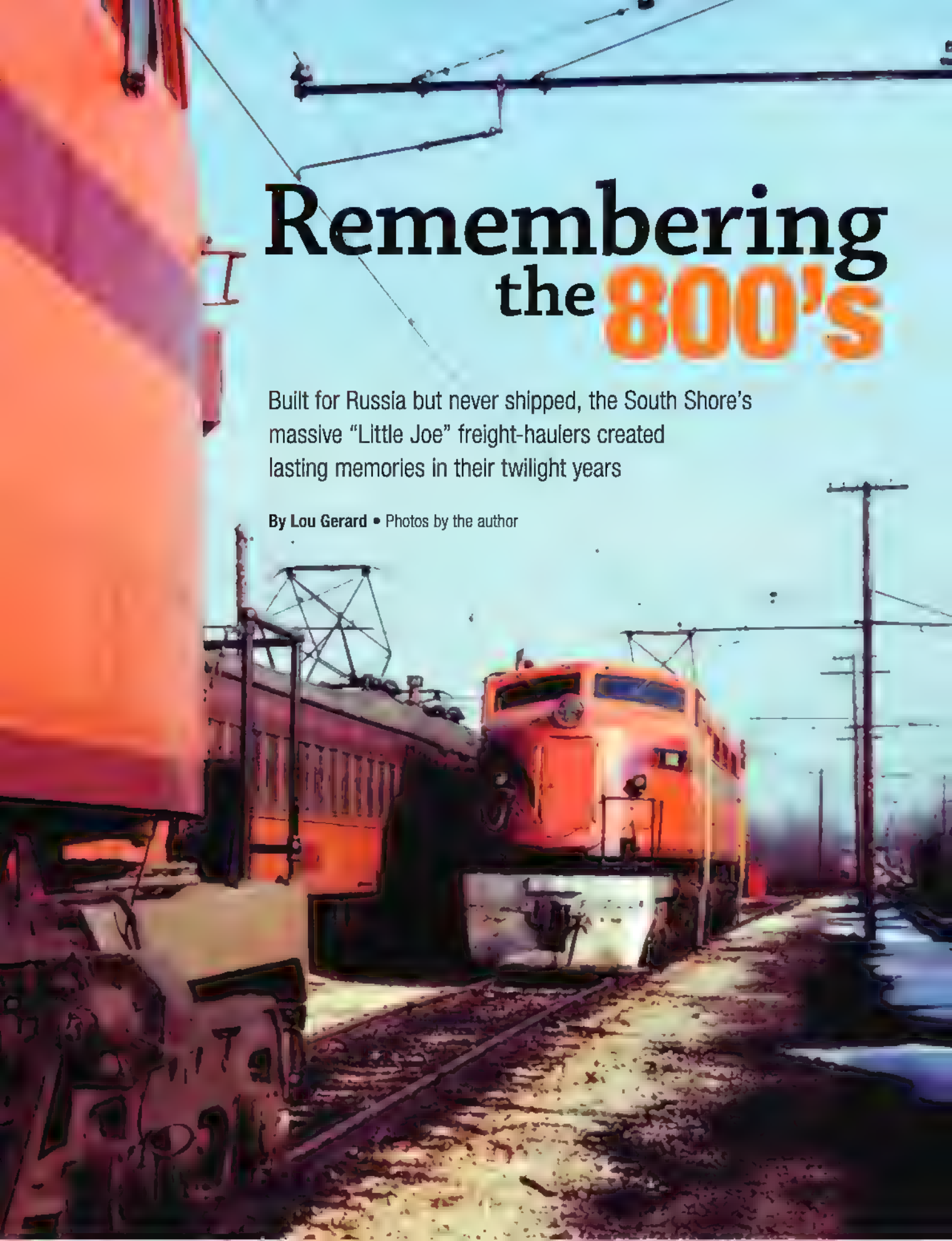
It is not known whether Loewy knew of Dohner's prior involvement in the design of the GG1, but if he did, he certainly made no mention of it. It is, however, certain that Loewy knew of Dohner's reputation. For instance, both men were featured among the top 10 leading industrial designers in the United States in the February 1934 issue of *Fortune* magazine. And many of the students Dohner trained at Pratt Institute became designers in Loewy's own firm.

Now that Donald Dohner's significant involvement in the design of the GG1 has been uncovered, how will history treat his role? Will he suddenly be elevated to the same status as Loewy, just as he was in 1934 when the GG1 was being designed? Or will his involvement in the project be discounted because of Loewy's overpowering legacy? Naturally, the answer to these questions will be sorted out in due time. Whatever the result, the next time you're near Strasburg, Pa., stop by the Railroad Museum of Pennsylvania. There, you can stand next to the prototype GG1—"Rivets"—and think of the man who designed it: Donald R. Dohner.

Remembering the 800's

Built for Russia but never shipped, the South Shore's massive "Little Joe" freight-haulers created lasting memories in their twilight years

By Lou Gerard • Photos by the author



The electric freight operations of the Chicago South Shore & South Bend Railroad had interested me from a young age. My earliest recollections of seeing the interurban's orange freight motors were from the early 1960s, when my dad would take me train-watching on Chicago's far South Side. He would pull off to the side of Brainard Avenue near the Indiana state line, and we would watch the electrics drill Burnham Yard, so called for its namesake village next to Chicago.

As time went on, the three 800-class engines, or "Little Joes" as I (and many fans) called them, became my favorite things to see on the South Shore. It was easy to find one switching Burnham, and just about every time we went on to Hammond, Ind., we would see one at the Calumet Avenue grade crossing with a long freight.

General Electric built 20 of the big electrics in 1948–49 for operation in the Soviet Union, but shipment of them was embargoed owing to export restrictions during the Cold War. GE elected to finish the order anyway and find other buyers; it built the final 6 units to standard gauge instead of the 5-foot Russian gauge of the first 14. Designed to operate from 3,000-volt D.C. catenary, the locomotives had a 2-D+D-2 wheel arrangement, weighed 273 tons, and were 88 feet 10 inches long. The 5,600 h.p. Joes were among the biggest, most powerful electric locomotives ever built.

The South Shore was in the market for new freight power, and in spring 1949 purchased three of the Joes for bargain prices, but had to rewire them at its Michigan City, Ind., shops for CSS's 1,500-volt operation; they entered service the next fall as Nos. 801–803. Milwaukee Road bought 12 for its Rocky Mountain Division, and the other 5 went to the Paulista Railroad in Brazil. The name "Little Joe" seems to have originated on the Milwaukee, because on the South Shore, they were known simply as "800's." The moniker "Joe" is said to be for Joseph Stalin, the Soviet leader at the time

The 801 and 802 repose at Michigan City on February 24, 1973 (opposite page). At Burnham Yard (top), 801 and 803 are both busy in March '76. On January 24, 1981 (above), in Gary, 803 crosses Broadway next to the old passenger station. Illinois Railway Museum has the big sign.

As the years passed, it became harder to find an 800 working on my South Shore visits, and several times when I went to Michigan City, I would find all three parked in a row, although with their pantographs up touching the catenary, seemingly ready to go. I was able to get some good photos of them in the shops during inspections, and I also shot them a few times on the street-running in Michigan City. This was quite a sight, and the 800's dwarfed the motor vehicles next to them.

One Sunday, my parents and I ran across the 803 crossing Route 12 in Michigan City as it was switching a customer across from the NIPSCO (Northern Indiana Public Service) power plant. And I once chased the 803 with an empty unit coal train out of the NIPSCO plant on a dark November afternoon. Just pacing it after I ran out of light for photos and hearing its horn blowing for grade crossings and seeing the headlight and number boards in the darkness was quite memorable.

I later learned that the 800's were hard on South Shore's power distribution system because of their excessive draw of current when hauling heavy tonnage, especially unit coal trains. When South Shore obtained road diesels in 1969, the 800's gave way to them for this work. South Shore people told me the 800's were used more during the night hours, logical enough since less current was needed at night for the passenger trains.

South Shore's first road diesels were three pairs of cow-calf NW2 types (model TR2), leased from parent (since January 1967) Chesapeake & Ohio to haul the coal trains. CSS&SB numbered them 602–607. (CSS 601 was an SW1 switcher acquired from New York State's Buffalo Creek in 1955 to help build South Shore's East Chicago bypass alongside the new Indiana Toll

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From the top: In a June '75 view from 801's cab at Burnham Yard's west end, an eastbound passenger train passes a MoPac Geep. On the same ride, the W. W. Young siding is switched. Engineer Kenny works 801 in 1976.

Road. The little EMD became the Michigan City shop switcher, and also pulled CSS's ex-Indiana Railroad line car to sites of overhead wire failure or construction.) Four leased C&O GP7's replaced the cow-calf sets in October '70, and those Geeps were exchanged, after being damaged, for what eventually became a fleet of eight leased Chessie GP7's, numbered CSS 1501–1508; South Shore took title to them in 1976.

Meantime, besides the 800's, South Shore's other major latter-day electric freight power, replacing earlier small steeple-cabs (including some from Illinois Central), was a group of seven 700-series box-cabs. In 1954–55, CSS acquired 10 New York Central R-2 class General Electric 600-volt third-rail locomotives built in 1930–31. Michigan City shops converted six for 1,500-volt catenary operation, numbered 701–706, during 1955–58, and a seventh, No. 707, in 1968. By the time I was frequenting the line from my Chicago North Side home, pairs of 700's regularly supplemented the Joes as road freight power.

By early 1975, only a couple of jobs regularly rated 700's, and I heard that the box-cabs had been removed from the Gary Switch Run owing to problems in obtaining new wheels for them, and that the 800's had taken over. Of course I had to check this out! On a nice sunny Saturday in March '75, my friend John White and I headed down to Gary, where we found the 802 parked in the coach yard west of the depot. Both "pans" were down, and nobody was around. This was a start.

We decided to head back toward

The 803 at work, clockwise from above: M.U. 101 passes at the EJ&E interchange at Goff Junction in Gary in July 1980; cruising east on Michigan City's 10th Street May 14, 1976; and from above at Gary's Clark Road in '80.

Hammond to see what we could find. As we approached the interchange with the Baltimore & Ohio Chicago Terminal in East Chicago, there stood the 801 ready to pull its train back to the main line! We hot-footed it over the Calumet Avenue grade crossing in time to photograph it rolling by in beautiful sunlight. We spent the next hour watching it switch Burnham, than set up west of Hammond station as 801 headed east, with both pans up, pulling a long train

A couple of weeks later, I went back to Burnham and found the 803 switching the yard, so I parked and walked over and watched it kicking cars. I never saw any diesel make such short work of a cut of cars as the 803 did, bouncing back and forth like a slingshot, then going into another track and pulling a cut out and start kicking cars again

After I'd been watching for a while, the engineer, "Kenny," motioned me over. I looked at him in disbelief, but he waved at me again to come on up I was up that ladder like a rocket and into the huge cab. He just said, "Hi," and told me to sit down and enjoy

He didn't have to say it twice. I sat in the left-side seat and enjoyed the drilling, back and forth. After sitting a while and taking pictures out the cab window, I got up and stood next to him, watching him working that big 37-notch controller, then shutting off and applying the independent brake while kicking cars.

After about a half hour of switching, Kenny told me they had to spot a car at an industry across the main line. After crossing over the main tracks, we removed an empty car from the cus-

Clockwise from top, all of 803 in January '81: Pulling cars from the Georgia Pacific siding on the 10th; working the East Chicago industrial spur on the 24th; and parked on the 10th at Kensington, below the IC main, while the crew is off at lunch (note the Pullman plant tower at top left).

tomer's siding and spotted a loaded boxcar We crossed back over to the yard and made a drop to position the empty in front of the 803. Kenny then shoved the car to a coupling with a cut of cars. He said that this cut was bound for the B&OCT interchange in East Chicago and asked if I wanted to ride there with them, as it was OK with the conductor, whose name was Rudy. Kenny didn't have to twist my arm!

We shoved the train from Burnham through Hammond, crossing over at Calumet Avenue and down across the B&OCT main line and into the interchange tracks, which of course were wired. I had never before seen this move, and never saw it again. We cut off and changed ends, which was accomplished by walking through the long carbody to the other cab. It was something to hear up close all the noise from the motor blowers

We coupled to another cut of cars to take back to Burnham. After enjoying a soda pop from DeLock's mini-mart that the brakeman brought over for me, we went back west to Burnham. We yarded the train and changed ends again, then ran back to the east end, where it was time for me to get off. I thanked Kenny and Rudy and the rest of the crew for a great afternoon. They tied the 803 onto the train and made an air test, and I watched them head onto the eastbound main. For this South Shore 800 fan, the ride had been a dream come true.

Thanks to Kenny and a few other friendly South Shore engineers, I was able to ride all three 800's at one time or another, and I spent many

On January 17, 1981, the 802 hauls the first of its two successor GP38-2's, 2000 and 2001 (near the rear of the train), into Hammond.

We thought 803 was done for when it dropped its brake rigging on the 31st, but not yet!

Saturdays chasing them. An ominous sign came in 1976, when the 801 was retired to supply parts to keep the 802 and 803 running. In 1980, the South Shore placed an order with EMD for 10 new GP38-2 diesels to replace the last two active 800's and its fleet of 11 secondhand Geeps, which included the eight from the C&O and three ex-Florida East Coast GP9's purchased in 1978. A group of us—Don Ellison, Bill Raia and his son Mike, and Gary Crawford—went out many weekends in late summer 1980 to chase the 800's on the Gary switcher.

In December '80 and January '81, we didn't miss a weekend, as the first 38-2's were due in January. Indeed, on the 17th, the 802 picked up the first two, Nos. 2000 and 2001, from the B&OCT interchange and hauled them with a cut of cars to Burnham Yard. The Geeps were painted yellow with blue tops, the colors of South Shore's parent C&O, although sort of reversed. That day, we were part of the biggest crowd chasing the South Shore that we had ever seen. The end for electric freight was at hand.

Our finale occurred on January 31. The 803 was heading into the Georgia Pacific siding in Gary when we heard a gush of air, and the motor and its train came to a stop fouling the westbound main track. The 803 had dropped part of its brake rigging, which was stuck under the engine at the switch. While the crew assessed the situation, I went to my car and got a few tools out of the trunk, and we helped the crew remove some pins to release the brake rigging so they could move into the clear.

A shop crew came out from Michigan City and removed the rest of the rigging. We then went to lunch, expecting that the 803 and its train would be rescued by a diesel.

After lunch, though, when we went back to see what was going on, we were greeted by the 803 highballing west along the main line next to the Indiana Toll Road! We did a quick about-face and chased it to the B&OCT interchange, where it made a pick-up and then went on to Burnham Yard to drop the train. We watched as the big motor headed east out of the yard with just its caboose on what turned out to be the last time I would see an 800 run on the South Shore

Although the 800's were done, vestiges of the "old South Shore" remained . . . and have returned. Chessie sold the railroad to a consortium called Venango River Corp. in 1984. In late 1989, Anacostia & Pacific Corp. bought the by-then-bankrupt South Shore, and the following year, A&P sold the main line and other passenger-service assets to the Northern Indiana Commuter Transportation District (NICTD, or "Nick-D"), formed in 1977. (A&P still owns the shops, the general offices, freight yard tracks, and industrial spurs.) NICTD bankrolled 44 new M.U. cars that began replacing the old orange interurbans in 1982. The 10 GP38-2's, gradually repainted beginning in 1985 into a retro scheme of orange with maroon trim, continue to work for A&P's "South-Shore Freight," helped out by run-through Class 1 diesels on coal trains.

Moreover, two of the 800's are preserved. Although the stripped 801 was scrapped in 1981, the 802 went to the B&O Museum in Baltimore. It later moved, and now is on display near its GE Erie birthplace in North East, Pa., at the Lake Shore Railway Museum, alongside CSX's former New York Central and Norfolk Southern's ex-Nickel Plate main lines The 803 went to the Illinois Railway Museum at Union, where it was repainted and has operated occasionally, though it normally is stored indoors. For me, just looking at the 803 today brings back a flood of nice memories from 30 years ago. ■

Waterloo, Iowa, Summer 1949: WCF&N car 102 loads express up front while waiting at the Mulberry Street station to depart as train 4 for Cedar Rapids at 9:45 a.m.

Waterloo to Cedar Rapids on an open rear platform

In 1949, a teenage railfan has an interurban adventure

By Richard J. Anderson • Photos by the author

"Are you sure you want to sit out here?" The smartly uniformed conductor removed his squarish, visored hat and scratched his head. "It gets kind of rough once we get going on the line to Cedar Rapids."

The dark blue uniform sporting polished brass buttons could have been worn by a trainman assigned to a *Zephyr* or a *Rocket*. But on this summer day in 1949, the clothes identified their wearer as a conductor for the Waterloo, Cedar Falls & Northern Railroad, one of Iowa's last classic interurbans. He and I were on the open rear platform of car 102, one of three such observation cars that had provided passenger service between Waterloo and Cedar Rapids since 1914. Built by the McGuire-Cummings Co. of Chicago, the 102 once had offered first-class parlor and buffet service, coupled behind a powered passenger-baggage combination car. The parlor-car amenities had been discontinued during World War I. The three cars could run solo, being outfitted with controls for a motorman. Their small kitchenettes had become space for baggage and express, and the upholstered parlor chairs had been replaced with regular coach seats.

"I'd really like to ride back here," I replied. I had seated myself on the metal stepbox that the conductor had just moved up from the street onto the observation platform. "I'll stay seated. I'll go inside if it gets too rough."

"I guess you will be OK," the conductor conceded. He replaced the hat, bearing the gold-plated CONDUCTOR insignia, on his head of neatly trimmed gray hair. "But if it gets too rough, I want you to come on inside. You can look out the big back window and see just about everything you could see from out here."

I looked out from the platform onto Mulberry Street in downtown Waterloo. The car had been backed into position beside the WCF&N passenger station, an

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imposing presence at the corner of Mulberry and East Fourth since May 1917. A truck was backed up to the baggage door at the front of the car. Some boxes and packages were put on board.

The car wore the distinctive orange and cream scheme that WCF&N had used since the early '30s. The company logo on each side of the car proclaimed it to be owned by the "Cedar Valley Road." Car 102 was big by interurban standards, nearly the size of the passenger equipment on the steam roads. It was as big as the Pacific Electric interurbans I'd ridden when we'd lived in southern California during World War II. With gas rationing providing only 4 gallons of fuel a week, the Pacific Electric was the only way to get from our family's home in Monrovia to shopping or other appointments in Los Angeles or Pasadena.

The hiss of 102's brakes being released and the *thump thump throb* of air pumps were further reminders of my Pacific Electric days. A couple of *baamps* resounded from the distinctive horn, and we began trundling slowly along Mulberry Street. The large station building receded into the distance.

"You'll get to see more of the railroad than you would have if you'd made this trip a couple of years ago." The conductor had joined me again on the rear platform. "We used to head east from the station toward Cedar Rapids on tracks in Lafayette. Since they stopped the street-running, we run west and then around the north side of Waterloo on the belt line. You'll get to see the shops when we go past them in a few minutes." Yes, he'd already put the "railfan" label on his 15-year-old passenger. He punched a hole in one coupon of my ticket, which guaranteed WCF&N transportation to Cedar Rapids and back. "Don't forget to come inside if it gets too rough out here," he reiterated as he returned inside to experience what undoubtedly would be a more comfortable ride.

Car 102 moved onto double track as we turned into Conger Street. The motorman's liberal use of the air horn frequently reminded auto drivers of our presence. A few waved at the boy on the back platform. I waved back. After a few blocks, we turned north and soon were crossing Illinois Central's main line at West Tower. The conductor reappeared as we stopped beyond the diamonds.

"We have to turn the car on a wye here. We're headed northwest, but we need to be headed southeast toward Cedar Rapids." He held the rope guiding the trolley pole as we slowly moved back into the tail track of the wye. A track switch was thrown, allowing car 102 to move forward back onto the belt line, now properly headed for Cedar Rapids.

"Look out on the left, there, and you'll soon see our shops and roundhouse."

I looked, and there were the shops, including a turntable, complete with a web of trolley wires above it. The scene looked exactly as it had in one of the six photos that accompanied a four-page WCF&N article, with photos by D. W. Durchenwald, in the January 1949 issue of TRAINS magazine. That article was one reason I was on the back platform of 102 on this summer day a few months later.

WCF&N 102, deadheading from the yard to the Waterloo depot, clatters across the IC at West Tower September 18, 1949 (top). The web of wires above the turntable (above) was notable.

Top photo, William D. Middleton; above photo, D. W. Durchenwald

Train-watching in Waterloo

My family and I, having relocated to Iowa, frequently visited relatives in Waterloo. My uncle was an orthodontist in a building at the corner of East Fourth and Lafayette, where until the end of downtown street operation, he'd had a great view of the WCF&N interurbans inching around the tight corner.

During these visits, I was on my own with time to kill, and it was not long before I discovered some train-watching spots. West of the Cedar River in central Waterloo, where the main lines of the Chicago Great Western and Rock Island were parallel for several blocks, there always seemed to be something coming or

After boarding a passenger, 102 was still going slow enough for me to stand to take a photo.

going ["The Great Great Western Freight Encounter," Summer 2002 CLASSIC TRAINS]. Just east of CGW's bridge, Water Street tower—where CGW crossed IC's downtown passenger line—was another great place. This crossing was a short walk from the two passenger stations, one on each side of the river.

My favorite spot, though, was CGW's Highland Yard, just a few blocks from where we were visiting on Vine Street, a mile or so east of downtown. This small yard was the principal interchange point between the Great Western and WCF&N. A spur from the interurban's belt line joined the steam road at a switch just west of the yard, and trolley wire had been strung over a couple of the yard tracks to enable the WCF&N's freight motors to make pick-up and drop-off moves. CGW based an 0-6-0 switcher with a slope-backed tender in Waterloo, and watching the crews of the two roads coordinate interchange filled many a wonderful morning for me.

But it was the TRAINS article that sparked the idea I might be able to ride the WCF&N's trains as well as just watch them. I checked my latest copy of the *Official Guide* (the thoughtful CB&Q agent in my hometown, Red Oak, got rid of his outdated *Guides* by giving them to me). I could board WCF&N train 4 in Waterloo at 9:45 a.m., which arrived in Cedar Rapids, 65 miles away, at 11:45. My return would be on No. 15, departing at 1:45 p.m. with a 3:25 arrival back in Waterloo. Yes, I could do it. I would leave home after breakfast and be back well before dinner. My family would agree to that. So here I was, seated on a metal stepbox on the rear platform of car 102, running as train 4, as we plied the belt line track around Waterloo's north side.

We clattered over the switch marking the spur's branching toward Highland Yard a mile to the south. We ducked under the CGW main and crossed the IC a second time at grade at Rath Tower, named for meatpacker Rath Packing Co., whose large brick buildings and smokestacks could be seen to the west. I'd heard that WCF&N was the major provider of rail service to both Rath and the John Deere farm implement plant, Waterloo's two largest industries.

The true interurban experience

Soon we were picking up speed on the 85-lb. rails of the line to Cedar Rapids. The Elk Run bridge over the Cedar River looked just as it had in the photo in the TRAINS piece. We swayed along, paralleling the line of trees that marked the river's course. I heard the *baamps* from the horn before every road crossing. I closed my eyes tightly for these, as the speeding interurban whipped up quite a bit of gravel dust as it passed the crossings. The conductor borrowed my stepbox seat during a brief stop at what I recall as Gilbertville so he could help a woman in a brightly colored dress board the car.

As we approached La Porte City, the interurban's track began running close to the Rock Island's. This was RI's Burlington–Cedar Rapids–Waterloo-Manly, Iowa, line, the route of the Twin Cities–St. Louis *Zephyr Rocket* in concert with CB&Q south of Burlington, Iowa. No RI trains were visible today, though. We did not meet any WCF&N freights, either, although cars spotted at stockyards, coal dealers, and grain elevators in the towns of Urbana, Lafayette, and Robins were evidence that the freight motors were being kept busy. On the return that afternoon, I did glimpse Rock Island's Cedar Rapids–Decorah mixed train at Center Point. A shabby Harriman-roof combine trailed a half dozen freight cars pulled by an Alco road-switcher.

"They had steam on that run until just a little while ago," the conductor said, gesturing toward the Rock Island train as he signaled the motorman to put Center Point behind us.

A row of switchstands marked the beginning of Shaver Yard and our en-

trance into Cedar Rapids. We moved slowly through the yard, enabling me to get a photo of steeple-cab freight motor 181 switching. Built for WCF&N in 1915 by McGuire-Cummings, it would serve until 1957. McGuire-Cummings relocated to Paris, Ill., in 1919, continuing to be a premier builder of rolling stock for both electric and steam railroads.

We crossed IC's branch and clattered across several tracks of the Milwaukee Road. Our wheels squealed as flanges were forced against the light rail during a sharp turn to the right. After grinding up a steep grade, we hissed to a stop at WCF&N's Cedar Rapids station at the north edge of downtown. Scars in the street paving near the depot were evidence that Cedar Valley Road cars had used street trackage of the Cedar Rapids & Iowa City ("Crandic") to reach an interurban terminal the roads shared in the center of the city. After Crandic discontinued its city streetcar service in November 1939, WCF&N remodeled a house at 10th Street and A Avenue, NE, to serve as its Cedar Rapids depot.

During the layover, car 102 had been turned on the station wye and was headed north. The conductor and I stood next to it as he asked, "Are you going to ride the platform back to Waterloo?"

"Sure," I said. "This is turning out to be a great trip. Just great. I can't wait to tell my family all about it."

"I expect they'll know you've been up to something different before you say anything," he said. As I enjoyed the Iowa countryside from my rolling vantage point on our northbound trip, I wondered what the conductor had meant.

At the south edge of Waterloo, we waited as an eastbound IC passenger train steamed across the interurban line at Rath Tower. "That's IC number 16," the conductor said. He was standing beside me on the platform, ready to get off and protect our train from the rear should the delay be too long. "He's running over an hour late. I don't expect he'll make up much time to Chicago."

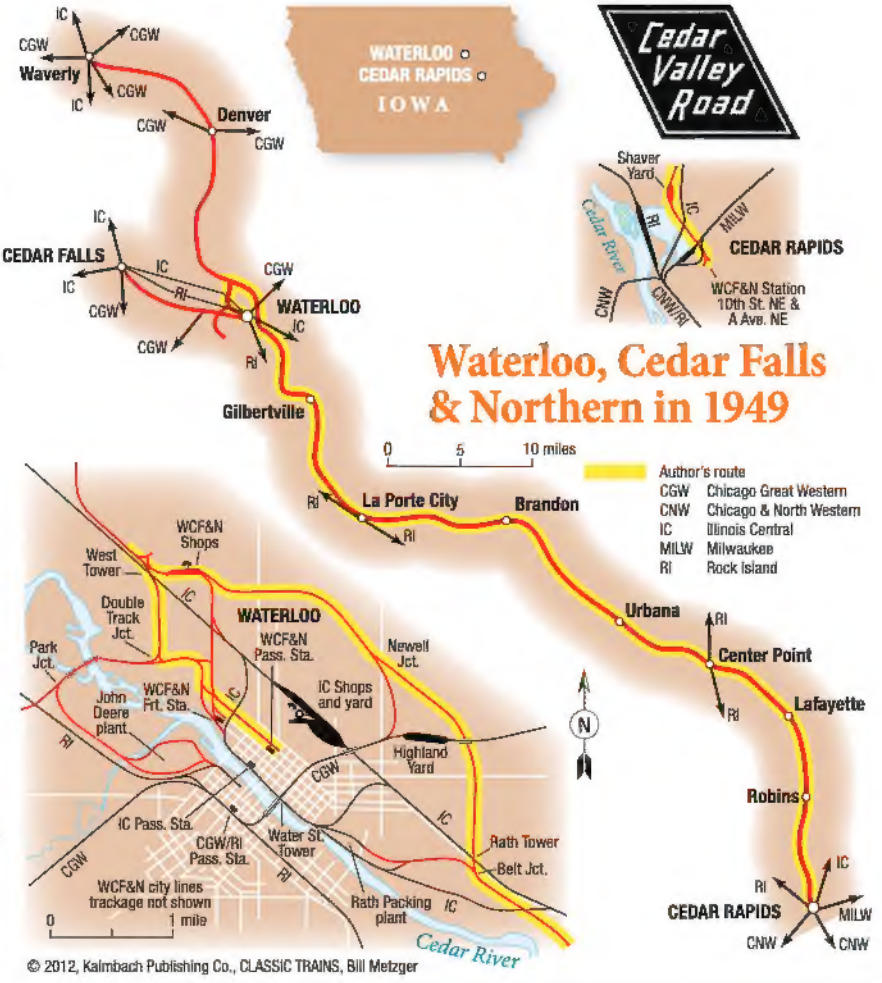
At the wye near the shops and West Tower, we again did a change-of-direction move and soon were rolling to a stop at the station on Mulberry Street. The conductor introduced me to the motorman. I thanked them both, bid them farewell, and began the half-hour walk back to my uncle's home on Vine Street.

"What on earth have you been doing?" asked my mother as I entered the house. "It was great," I said. "I rode the observation platform on the interurban all the way to Cedar Rapids and back."

"Go to the bathroom and look in the mirror, and don't come out until you've done what it's obvious you need to do."

I looked in the mirror. The face that stared back was familiar, but it was dirtier than I had ever known it to be. A good bit of the dust and grime kicked up by the interurban had found its way to my face. I then remembered the conductor's words: "I expect they'll know you've been up to something different before you say anything."

A few minutes with soap and water removed the facial evidence of my adventure. A half century, however, has not removed the wonderful memory of that happy day for this now not-so-youthful railfan. I would take that ride again if I could, dirty face and all.



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Ready to go home: 102 is about to leave WCF&N's post-1939 depot in Cedar Rapids at 1:45 p.m.